

The Coastal Sites

Possible Port Towns of Harappan time in Gujarat

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Gujarat, the westernmost State of India, is bordered by the long coast of the Arabian Sea on its west. This coast has been providing access to ancient voyagers, mariners and traders to the country since time immemorial. Discovery of a large number of Harappan settlements along this coast and presence of significant quantity of standard Harappan objects in many sites of ancient Mesopotamia and Oman coasts vis a vis finding a few objects of West Asian origin in Harappan sites firmly establishes that there was a well-organized trade contact

between these two regions of the Old World. However, the evidence shows that contacts with the western regions of Iran and Mesopotamia existed during the Early Harappan period, many centuries before the growth of the Harappan cities (Mughal 1992).

The land of Gujarat has been under human occupation from the prehistoric time. Recent archaeological discoveries from this region indicate that some of the Mesolithic and early chalcolithic folks flourishing here in the beginning of the third millennium B.C. could have contributed towards making of the Indus civilization and its vast geographical spread. This civilization was spread approximately over one million sq. km area in present north-western India, Pakistan and south-eastern regions of Afghanistan. Initially it was believed that it followed a uniform character all over its expansion area but, of late, it is conclusively proved that the civilization was consisting of diverse regional characteristics.

At present more than 2000 sites of the Harappan civilization or its affinity are known in the Indian sub-continent through continuous explorations and survey carried out by researchers since the discovery of the first site in early 1920's. Of these over 550 sites are located in Gujarat alone. In Gujarat sites have been found almost in all parts of the state except the eastern hilly regions and the coastal region south of the Tapi River. It appears

that the Harappan settlements were connected with a trade network, operational both by waterways as well as overland routes. The connectivity between towns falling in the river valleys may have been by small flat-bottomed river boats opines J. M. Kenoyer (1998:89-90), 'flotillas of boats carried trade goods down the Indus River to the coast to meet up with the merchants bringing goods from Kutch and far away Oman'.

It has been established firmly on the basis of extensive survey of Sir Aurel Stein and findings of many scholars that Sumer and Elam and the Indus valley sites had trade relation during Harappan time and it was both by sea as well as land. According to Mackay (1938:5), "it is tempting to think that trade was carried on between Indus Valley cities and distant Sumer partly at least by sail rather than solely by caravan across what may have been not wholly friendly territory. The sea-board must also have been considerably nearer in the days of prosperity of the ancient city than now, as it is known to have been at Ur in the third millennium B.C." Richard H. Meadow (1994) also believes that "Sutkagen Dor, Sotka Koh, and Balakot sites were never on the coast at all. Instead they appear to have been situated a number of kilometres inland at strategic locations on or near important south flowing water courses that served as trade routes from inland drainage basins through the hills to the coast". Similar would have been the situation in respect of many sites on the Gujarat coast.

Harappan sites like Mohenjodaro, Harappa, Lothal, Dholavira etc. have yielded many artefacts of Mesopotamian influence/origin. Mohenjodaro was the first site which yielded three seals of the characteristic cylindrical shape of the Sumerian seal (Mackay 1938:7). Lothal yielded a circular Persian Gulf seal (Rao 1979:41). Besides fragments of a vessel of a greenish-grey stone (chlorite- schist) bearing engraved geometric pattern have been reported from a few sites including

Dholavira. The terracotta Mummy like figure from Lothal and the bull-grappling/bull-sacrifice scenes on Indus seals also indicate cultural contact. A large number of sites in Mesopotamia, such as Ur, Tell Asmar, Kish, Lagash, Umma, Nippur, Tepe Gawra, Tell Agrab and Ashur have yielded a variety of objects of Harappan origin. These objects include seals, beads, dice, terracotta figurines, objects of shell and ivory, etc. (Lal 1997:182). Kish and Nippur has yielded typical rectangular seals of Harappan. Two seals recovered from the island of Failaka near the head of the Persian Gulf also bear Harappan inscription. Similarly a circular seal bearing Indus script was recovered from Madinat Hamad in Oman by an Indian team during excavation in 1984-85 (K.M. Srivastava 1991). Large quantity of Harappan black slipped jar pieces has also been reported from many coastal sites of the Oman Island (Ajithprasad 2006).

The above evidences clearly indicate that during the Harappan time traders from both sides travelled across the sea for bringing exotic items to their respective land. However, there is a dearth of archaeological remains which can be identified as port, though many coastal sites have been excavated along the Gujarat coast. However, in Gujarat, Lothal is the first site which provided evidence of a dock-yard. Kuntasi on the Gulf of Kachchh and Saran (Dholavira) in the Great Rann are other sites which on the ground of their geographical location are suggestive of ports. Therefore, it becomes necessary to assess other coastal sites of Gujarat which may have been active as a port during the Harappan time.

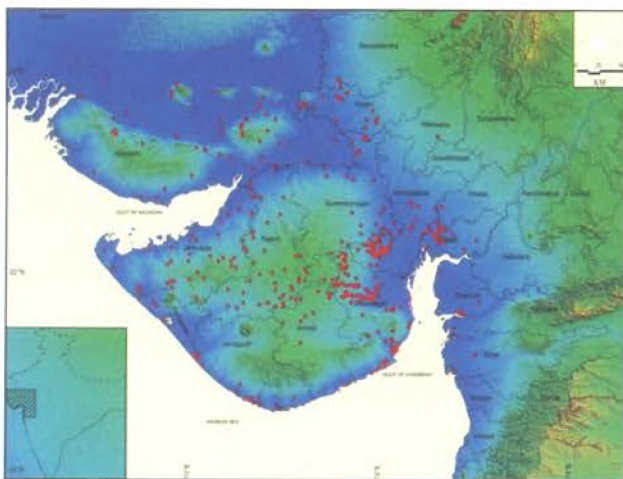


Fig.1 Distribution of Harappan sites in Gujarat: After S.V. Rajesh 2011

Along the Gujarat coast about 44 sites of Harappan or Harappan affinities have been located so far. Of these 30 belong to Urban and rest to the Late or Post Urban period. On the Kachchh coast (including the Rann) 19 sites and on the Saurashtra and the mainland coast 25 sites have been located. The fortified settlements recorded so far are only nine and most of them, except Lothal, are on the coast of the Gulf of Kachchh or the Rann.

Lothal (22° 31' 25" N, 72° 14' 59" E)

Lothal, excavated during 1955 – 1962 by Archaeological Survey of India, is the first site which has been found associated with marine activities. The site has revealed presence of a dock besides a sealing of Persian Gulf origin. The site is spread over an area measuring 7.5 hectares. Excavations of the site revealed a 6 to 7m thick cultural accumulation deposited during VII successive phases of occupation. On the basis of archaeological findings two cultural periods have been identified in this deposit. The first settlement at the site was established by an indigenous chalcolithic folk using a distinct ceramic termed as Micaceous Red Ware. The Harappan came into contact with this indigenous culture during this initial phase. The succeeding phases represented various developments at the site during the Urban Harappan time whereas the last phase represented decadence phase of the Harappan.



Fig.2 Lothal Site Plan: After Abba Narain Lambab Associates 2004

The initial settlement at Lothal was a small village with a few mud-brick houses raised on a natural dune. It was surrounded by a mud bund on all four sides to protect it from inundation. A devastating flood compelled the inhabitants to remodel and expand the settlement. As the result the settlement was a planned in a bipartite manner; a carefully laid acropolis on south-eastern sector and a lower town to the north and west of the former. The acropolis consisted of two large buildings: the ruler's mansion and the warehouse whereas the Lower Town consisted of a domestic quarter, workshops and a market place. A dock was built along the eastern margin of the town. According to S.R. Rao, "The town was planned in several rectangular blocks separated from each other by streets and lanes. The arterial streets divided the town into several grids in chess-board pattern (Rao 1979:85)."

The Lothal Dock

On the eastern side of the settlement is located a brick lined large rectangular tank like structure which has been identified by S. R. Rao as a dockyard. He records that "its western embankment wall is 716 ft., the eastern 705 ft. 6 in., the southern 117 ft., and the northern 123 ft. in length. The width of the wall is 6 ft. at the foundation level in the case of the western arm and 5 ft. in other cases. The extant height of the wall in the southwest corner of the basin is 11 ft, with 42 courses of bricks. It has been so designed as to meet the requirements of a dock". According to him the original entry for ships was in the northern wall which was later on shifted to eastern wall. The southern embankment of the dock was provided with a brick-built spill channel which served as a spill way for the excess water entering the basin at high tide through the inlet. The dock was designed to ensure berthing space for at least 20 to 30 boats of fairly large size. It was constructed in circa 2350 B.C. and was destroyed in circa 1900 B.C. by a flood of great intensity.



Fig.3 Lothal Dock

Many a scholars have argued against Rao's interpretation of this large trough like structure and believe that it was a tank meant to store water for drinking and irrigation purposes (Shah 1960; Leshnik 1968; Pandya 1977). However most of the scholars agree that Lothal was a commercial and trading centre (Possehl and Kennedy 1979). Therefore, whether the large brick structure was a dock or not, being a coastal site on the mouth of the Gulf of Khambhat, possibility of Lothal being an important port cannot be negated.

Another characteristic feature of Lothal was its 'Warehouse' which was located in the citadel area close to the wharf built along the western embankment of the dock. It also came into existence with the dock and was meant to examine and seal the cargo. The warehouse consisted of was consisted of 12 solid blocks of partially-burnt mud-bricks each measuring 12ft.square. These were arranged in three rows of four blocks each in such way that a 4ft. wide passage was left around each of them for easy movement of labour. Interestingly the cultural accumulation in a passage in the south-eastern area yielded as many as 65 terracotta sealings, each bearing one or more impression of seals.



Fig.4 Lothal Warehouse

Kuntasi (22° 50' 40" N, 70° 37' 30" E)

Kuntasi on the southern shore of the Gulf of Kachchh stands on the right bank of a seasonal river named Phulki in Rajkot district. The Gulf is at a distance of about 5km from the site and Navlakhi Port, a non-major port, is situated further northwest into the Gulf at about 8km distance.



Fig.5 Location of Harappan site Kuntasi on meandering river Phulki

Excavation at the ancient site revealed remains of a fortified settlement of Harappan period with 7m thick cultural accumulation. Two cultural periods, Mature Harappan (Ca.2500-Ca.1900B.C.) and Late Harappan (Ca.1900-Ca.1700B.C.) respectively have been identified at the site. However, stratigraphical evidence suggested that before the advent of the Harappan, the site was occupied by a few Mesolithic hunter-gatherers (Dhavalikar et.al, 1996:25). Period I yielded Harappan pottery, cubical chert weights, beads of semiprecious stone, beads of steatite and faience, gold beads, copper rings and bangles besides terracotta cart frames and a square faience seal without animal figure. Period II is represented by general decline in the life of the settlement.

The settlement was fortified and the houses inside were arranged along four sides leaving an open area at the centre. Structures were built both in stone and mud brick.

Remains of a Jetty at Kuntasi

Kuntasi has yielded a few interesting structures along the river front of the settlement. These include a ramp leading to the river, a watch tower and a platform. The ramp was located at south-eastern corner of the

settlement between the eastern and the southern arms of the fortification. It was 4.10m wide and 9.50m long and was built of boulders set in mud mortar with large flat stones along the edge. According to the excavator it was provided for facilitating the movement of goods from within the fortified area to the river. Another remarkable feature of the settlement was a squarish watch tower provided to the exterior of the south-western corner, near the river. It measured about 10.55m x 8.50m in dimension with an extant height of 0.80m. According to the excavator 'originally it must have been at least 10 to 12m high and could have been for keeping an eye on boats coming to Kuntasi through the Gulf of Kachchh and possibility of its being some sort of lighthouse can also not be ruled out (Dhavalikar et.al.1996:55)'. Further, to the north of the aforesaid tower a 9.80m long and 4.10m wide platform built of roughly flattish stones in mud masonry was exposed. It may have been used as a landing platform for unloading raw materials which were brought by the ships through the creek and also for loading the finished goods from the workshops which were located in north and north-east of it. All these structures belonged to Urban Harappan period dated to circa 2200-1900B.C at the site.

According to excavator, "although the Sea is presently 4km away, it is highly likely that it was much nearer, by

about 1 or 2 km in the ancient past. As a matter of fact there is every likelihood that in Harappan times the site was located just on the coast and in that case it may have served as a port. Incidentally the discovery of stone anchors from the excavations support the contention. It was a port on the creek even in the mediaeval times (Dhavalikar et al. 1996: 3)".

However, in view of the excavator, the site doesn't seem to be directly involved in foreign trade and was not a main trading centre. In the opinion of the excavator, 'trading activity at Kuntasi, like any other early Historical port site on the western coast, might be a seasonal phenomenon. Vessels might be plying with the help of tides and it is possible that even during normal high tide vessels could reach up to the site. The Little Rann of Kutch and the creeks were having less silt during the Harappan times. Tidal range must have been higher during that period. The present tidal range is 7.5m, which is highest on the west coast of India' (Dhavalikar, et al. 1996:10).

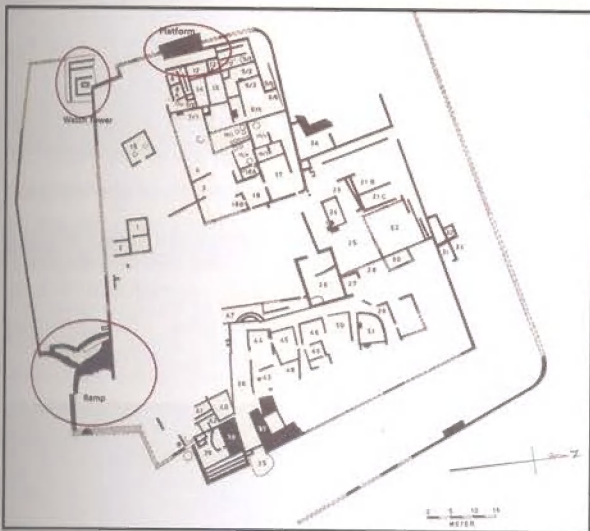


Fig.6 Kuntasi lay-out Plan: After Dhavalikar et al., 1996

Bagasra (23° 03' 30" N, 70° 37' 10" E)

The Ancient site at Bagasra in Maliya taluka of Rajkot district is located on the southeastern shore of Gulf of Kachchh. Excavations at the site revealed a fortified Harappan settlement measuring 160x120 m in area. The excavations also brought to light four distinct phases of Harappan settlement through a 7.75 m thick cultural deposit. Phases I to III represent events of urban period whereas the last phase, i.e. Phase IV, belongs to the Post Urban Harappan habitation.



Fig.7 Bead factory at Bagasra: Courtesy M.S. University of Baroda

The material remains unearthed from the site includes typical Harappan steatite seals and terracotta sealing and many other objects made of a variety of stone, shell, bone, metal, and clay etc. Objects such as bone points and clay lumps with reed impressions were also recovered. The site provided clear evidence of craft production and trade. Workshops for making shell objects, stone bead manufacturing, faience making and copper working have been found (IAR 1995-96; 1996-97; 1997-98; 1999-2000; Sonawane et al. 2003: 21-50).



Fig.8 Shell working area at Bagasra: courtesy M.S. University of Baroda

The ancient site of Bagasra is situated at a distance of about 500m from the Gulf. The top of the mound is at 14m from the Main Sea Level (MSL). The thickness of the cultural accumulation at the site is 7.75m. Therefore, it can be assumed that the ancient ground level was about 6.25m above the sea level. Further the MSL at present is hardly 2m below the base of the mound which indicate that the site could have been accessible through

a wide depression which is still visible in north-east of the site and south-west of the Village Bagasra.



Fig.9 Bagasra Environment, courtesy Ajithprasad, MSU, Baroda

Shikarpur (23° 14' 15" N; 70° 40' 39" E)

Excavation at the Harappan site at Shikarpur in Bhachau taluka of Kachchh revealed a fortified settlement with a 6.40 m cultural deposit representing three distinct phases of Harappan occupation. Apart from the Harappan ceramic the site yielded good quantity of terracotta sealings, pendant, terracotta figurines of female and male and animals, cart frames, copper objects like bangles, rings, chisels and a Celt; shell beads and bangles, semi-precious stone objects like pendants and beads, cubical weights, drill bits, chert blades and bone objects. (IAR 1987-88; 1988-89; 1989-90; Bhan and Ajithprasad 2008:1-9; 2009:1-9).



Fig.10 General View of the Shikarpur site, courtesy M.S. University of Baroda

Interestingly, excavation of the central part of the settlement revealed existence of an open space possibly

surrounded by residential blocks which seems to be similar to the Kuntasi which has been identified as an emporium on the west coast. Shikarpur, on the other hand so far has yielded only terracotta sealings indicating that the site was mainly receiving cargo/goods from elsewhere. The excavators feel it was most likely a market.



Fig.11 Location of the Valamio Timbo on the Gulf of Kachchh

The highest contour of the present mound of Shikarpur is about 16m above the MSL and the thickness of the occupation deposit is about 6.40m. This shows that the ancient ground was about 9.60m above the MSL. The Gulf of Kachchh is about 2km south of the site and is connected to it through a rivulet that passes through the western periphery of the site. The locational geography and environment of the site are suggestive of its being an active port during Harappan time. Though, further detail study is required to be done in this direction.



Fig.12 Terracotta sealings from Shikarpur; courtesy M.S. University of Baroda



Fig.13 Terracotta sealings with different signatures on reverse: After Kharakwal, et al. 2012

Kanmer (23° 25' 4.6" N; 70° 51' 49.7" E)

The ancient site locally known as Bakarkot is situated about 200m north of the village Kanmer in eastern Kachchh (Gujarat). Excavation at the site has revealed a fivefold culture sequence beginning with Harappan culture and ending with medieval period through historical period. The Harappan deposit measuring about 6.50m in thickness represented the pre-fortification, Urban and other late phases of the Harappan culture. The Harappan settlement at Kanmer was laid out as a small fortress without any other division. Roughly squarish on plan, the fort covered an area of about 107m x 116m externally and about 72m X 79m internally. Inside the fort were found multipurpose building complexes which yielded most of the characteristic types of Harappan material culture such as ceramic, steatite seals, terracotta sealings, a variety of beads made of semiprecious stones, terracotta, shell, paste etc.; objects of shell, bones and copper/bronze; large number of drill bits and chert blades of both local

and the Rohri variety. Finding of three terracotta sealings with identical impression on their obverse but bearing different incised signs on their reverse is the most significant discovery which points towards a system of identity token (Kharakwal et al. 2011). The site also yielded remains of deep sea fish besides wood species like *Myristicamalabarica*, *Wrightia tinctoria*. The latter suggests contact between the Maharashtra coast south of Mumbai and Kachchh region (Carla Lancelotti et al, 2011). These findings indicate about the regional contact possibly by sea. Further the Mardhak Bet (island), famous for its agate mines is very close to Kanmer. The site also remained under occupation during Historic and Medieval times. Finding of almost a complete Torpedo jar of west Asian origin indicates that it had trade connection across the sea during 4th-5th century A.D.

Geomorphological and soil sediment studies, carried out by Deo and Rajguru (2010) around Kanmer, revealed that the ephemeral streamlets were holding surface water for a longer period due to relatively wet

climate prevalent in Kachchh during the mid-Holocene. The Little Rann was perhaps holding 2 to 5m deep water between 6000 and 2000BP and sea level was also higher what it is today. The Little Rann turned dry during the Late Holocene perhaps due to environmental change, local tectonics and uplifts of mud flats during the last 4000 to 2000 years BP. (Kharakwal et.al, 2012: 830)

The site is situated about 5km to the north of the Little Rann. The shore of the latter is visible from the hillock which lies just to the south of the site. However, the topographical map and the satellite imagery clearly show that the Rann is easily approachable from an estuary, just about 1.5km to the southeast of the site.

Nagwada (23° 18'N; 71° 42' 30"E)

Nagwada is located on the eastern shore of the Little Rann of Kachchh in Dasada Taluka of Surendranagar district in north Gujarat. Excavations conducted by the M.S. University of Baroda from 1985 to 1989 revealed a single period occupation divisible into two sub-periods. The first sub-period named IA is represented by burials of two distinct types: extended human and 'symbolic' burials. This burial pottery is similar to the early Harappan pottery reported from many sites in Sindh and Baluchistan (Ajithprasad 2011). Sub-period IB belongs to Urban Harappan time.

Nagwada was an important shell working site on Little Rann and produced a wide variety of shell objects. According to Bhan 'shells could have been obtained either from northern coastal line of Jamnagar district or from through Greater Rann of Kachchh, which was part of sea during Harappan times' (Bhan et al. 2003). The site appears to have had direct access to Rann through a water channel which is at present in the form of a nala (Khari Vokri).

Surkotada (23° 37'N; 70° 50'E)

Surkotada situated in eastern Kachchh on the western shore of Little Rann was excavated by Archaeological Survey of India in 1971-72. The Harappan settlement here was laid on a bipartite plan of rectangular shape. On the western side was located a well-fortified high citadel abutted by a low lying residential annexe on the east. Both of them were inter-connected by a small passage in between. The fortification was provided with rectangular bastion at corners. The main entrance to the citadel was from the southern side.



Fig.14 Location of Surkotada site on Little Rann of Kachchh

In view of the excavator the site was 'most probably a garrison complex to control eastward movement of the Harappans' (IAR 1970-71; 1971-72; Joshi 1972: 98-144; Joshi 1990). But it seems that this fortified settlement was most probably meant for exploitation of the local mineral resources, especially the agate and clay deposit of nearby Kandek area.

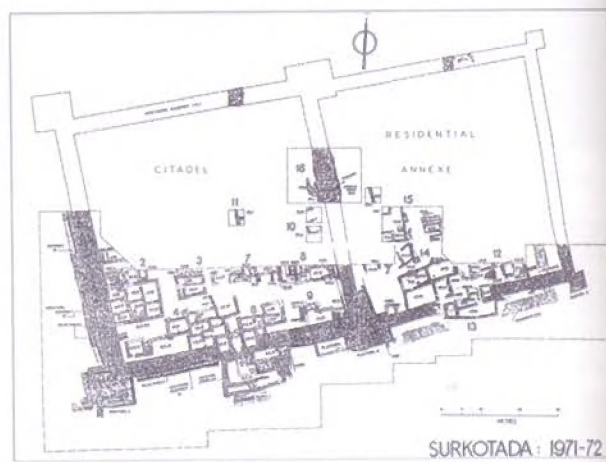


Fig.15 Settlement Planning at Surkotada: Courtesy ASI

At present a small rivulet named Rukmavati passes through the southern side of the site which according to Jagatpati Joshi (1990), the excavator of the site, in the ancient days was 3/4km wide and emptied itself further down into the Little Rann of Kutch'. Little Rann at present is about 6.5km to the east of the site. His observation is based on the ground survey and morphological examination of the physical features of the area between Surkotada mound and Adesar (a nearby town). Possibility of this wide channel serving as an access route to site for boats and ships in ancient past cannot be ruled out.

Dholavira (23° 53' 10" N, 70° 13' 00" E)

Harappan site of Dholavira is located in the Khadir Island in Great Rann of Kachchh. The site, spread over an area of about 100 hectares, is one among the five largest known Harappan cities of the Indian subcontinent. Excavations at the ancient mounds were carried out from the year 1990 to 2004 by the Archaeological Survey of India. This author also worked the site from the year 1984 to 2000. The site revealed a fortified town with three distinct divisions within. These divisions have been termed as citadel, middle town and lower town respectively. Further it has provided evidence of an amazing water management system of Harappan period. "The site is remarkable for its exquisite planning, monumental structures, aesthetic architecture, efficient water harvesting system and funerary architecture" (Bisht 1991; 1997).



Fig.16 General View of Dholavira: Courtesy Robitsingh Negi

Excavation through a deposit ranging from 6.30m to 12m in thickness revealed a cultural sequence that reflects seven stages of cultural development at the site. According to excavator, the seven cultural stages of Dholavira can be dated between 3500-1700 BC.



Fig.17 Dholavira: A passage to Northgate

A cemetery with a variety of funerary structures was found around a large ancient reservoir situated to the west of the ancient city. The most remarkable sepulchral structure type was in the form of large tumuli. These are circular spoke wheel type on plan with a central chamber which was being opened and reused as and when required. Initially these hemispherical structures were made of mud bricks but in subsequent phases stone was also used.

Among other significant findings at the site is an inscription composed of ten large-sized signs of the Indus script. It has been identified as signboard that may have been once hung on the façade of the Northgate of the citadel. The site has also provided evidences of industrial activities carried out at the site. Workshops for manufacturing of beads, shell objects, lapidary etc. have been excavated.

Dholavira seems to be a major trading centre covering whole of Gujarat region. As Gregory Posshel has designated Gujarat as a regional domain, Dholavira appears to be the capital city of it. It appears that Dholavira may have been a great exporter of varieties of beads, architectural stones, drill bits, clay, minerals and forest yields and sea products to sites in the Indus and the Sarasvati basin regions. Interestingly some of the lime stone pillar elements recovered from Mohenjodaro match well with the variety of limestone available in the quarry at Dholavira. An ancient lime stone quarry and factory site, presently known by the name of Varalpatta situated about 2.5km to the north of Dholavira on the way to Saran port, has yielded many unfinished architectural elements (IAR 1989-90; 1990-91; 1991-92; 1992-93; 1993-94; 1996-97; 1997-98; 1998-99; 1999-2000). However, finding of a fragment of a chlorite schist vessel seems to be the only artefact of foreign origin from the site.

Port site Saran (Dholavira)

Saran on the shore of the Great Rann of Kachchh is about 3.5km north of Dholavira. This seems to be a small Harappan port catering the needs of the ancient metropolis. The site is located on the left bank of a rivulet. Water of this rivulet at its source of origin is potable during major part of the year. It appears that the ancient marine engineers preferred a narrow creek between a small rocky outcrop and a hill for the jetty. Ruins of a large rectangular building in east-west

orientation are found on the flat top of the outcrop. This building may have been serving as a warehouse for temporary storage of the goods. On plan the building shows a row of nine small rooms set along its northern wall, which were possibly fronted with large verandas. At the eastern end the building had three small rooms. The rooms yielded very few pot shards belonging to the Late Urban Harappan assemblage (Bisht, per. commun.). The extant height of its walls measures 0.53m to 0.80m with a width measuring 0.70m. The lateral walls of the building on east and west were extending on the slope up to the rivulet below perhaps to create a large open enclosure. The western wall which is traceable up to a length of 18m, may have been terminating at a large platform of approximately 8sq.m located right on the bank of the river. The

enclosed area also seems to be further partitioned into two divisions by a north-south wall. The platform on the bank of the estuary appears to be meant for loading and unloading cargo.

The building was located at an altitude of 8m above the mean sea level (MSL). The present bed of the rivulet is about 6m below the base of the building and about 1.5m above the present surface of the Rann. If it is assumed that the Rann was an extension of the sea and was 4m deep during the Harappan time and the sea level was 1 to 2m higher than what is today, the water 6m deep water could have been sufficient to bring the vessels to the platform through estuary. Further the estuary may have been preferred as a secured mooring place to avoid the disturbance caused by the sea storms.



Fig. 18 Saran site on the southern shore of the Great Rann of Kachchh

Interestingly the location of the site indicate that the Harappan of Dholavira preferred this location because it was on the shortest route for the boats/ship coming from the Gulf/ Little Rann side and from the Sind in north across the Great Rann. Its location on south or west of Dholavira town would have made the journey slightly longer. Beside such sheltered space is not available in those directions.

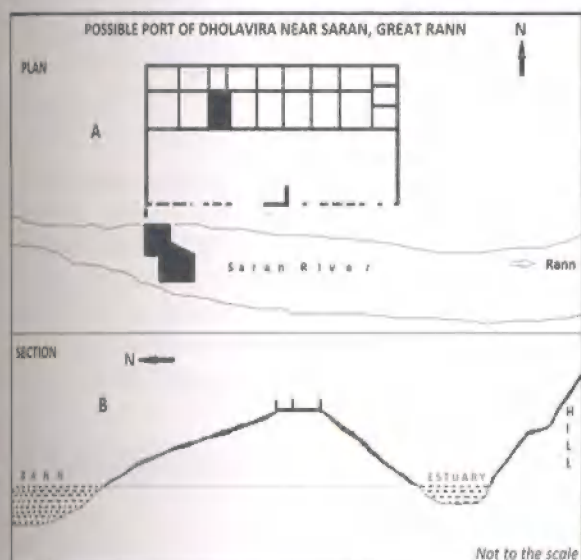


Fig.19

Pabu Math (23° 37'N; 70° 31'E)

Pabumath near village Suvaion the southern shore of the Great Rann of kachchh in Rapar Taluka was excavated by the Gujarat State Archaeology Department for three seasons from 1977-78 to 1980-81. The excavation revealed a 5m thick cultural deposit belonging to the Urban and Late Urban Harappan period. A large building complex consisting of a number of rooms and built with stones was partially exposed. Besides the Harappan ceramics the other finds included: an inscribed seal bearing a unicorn motif; beads of paste, carnelian, agate, chert, shell; and bangles of shell. (IAR77-78, 78-79 &1980-8). The location of the site is to the south-east of Dholavira, across the Great Rann.

Ner (23° 25'N; 70° 18' 30"E)

Ner is located on the shore of Great Rann, to the south of Dholavira. It site is located on the traditional land route that was connecting Khadir Bet and the main land

Kachchh during the dry season. This site may have served as halting station for the caravans before they were embarking on a boat or ship to cross the Rann. Mandriyara Mohra (23° 30'N; 70° 16'E) near Chobari, further north of Ner, is another site of similar nature (IAR1986-87).

Juni Kuran (23° 57' 76" N, 69° 45' 91" E)

The Harappan site Juni Kuran is located on the southern shore of Great Rann of Kachchh in the north-eastern margin of the Pachcham Bet in Kachchh District. The ancient mounds were excavated by Archaeological Survey of India during 2003-04 to 2005-06. The settlement roughly rectangular on plan is spread in an area of 410 x 350 m. The highest mound contains about 7 m deposit of Harappan period. The occupants of the site used mud-brick and stone in the construction of their houses and settlement fortification.

The site yielded remains of Mature and Late Harappan time. Excavations revealed that like Dholavira this town also consisted of a citadel, a middle town and a lower town. However, unlike former, the citadel, the middle town and the lower town here are located in northwest, south and east respectively. The settlement was fortified and furnished with gateways and two stadiums(?). Besides, the site yielded objects made of shell, terracotta, metals, semi-precious stones and bones. Steatite seal and fish hooks of copper were also recovered. Burials were also unearthed from the site (Pramanik, 2004: 45-67).



Fig.20 Location of Kotada Juni Kuran on the shore of the Great Rann

Navinal, Tal. Mundra, Kachchh

(23° 49' 17.5" N; 69° 35' 49.9" E)

Known as Benap-no-Timbo, the site has yielded ceramic assemblage similar to Rangpur IIA, IIB & III. Lot of shell waste found at the site indicates it being engaged in marine resource procurement. It is spread over an area measuring about 180m x 120m and contains a deposit of about 1 to 1.5m thickness (Ajithprasadper.commu.).

Todio Timbo, Tal. Abdasa, Kachchh

(23° 08' N; 68° 58' E)

Known as Bhedi no Timbo near village Bhedi, it is located on right bank of Nera River in Abdasa Taluka of Kachchh. The site is spread over an area of about 95m x 85m. It is about 12km north of the coast. It may have been an estuarine port of local importance (Rao 1963). The site has yielded ceramics of Rangpur IIB and IIC period. Hence may have been active during Urban and Late Urban Harappan time.

Bet Dwarka (22° 20' 00" N, 69° 05' 00" E)

Explorations (IAR 1969-70: 59) and excavations in this island (Rao 1990; Rao and Gaur 1992; Gaur and Sundaresh 2003) of Jamnagar district brought to light remains of Chalcolithic/Post Urban Harappan times. The excavator believes that availability of marine shells made it an attractive place for continuous habitation and it also served as a safe harbor in the ancient past (Gaur et al. 2005).

Nageshwar (22° 20' 00" N, 69° 03' 00" E)

Nageshwar is located in the neighbourhood of the Pindara and Poshitra Bay in Okhamandal taluka of Jamnagar district. These bays are rich in *Turbinella pyrum* and *Chicoreus ramosus* shells the main raw materials for manufacturing bangles, ladles and various other objects of shell. The site is situated near a large sweet water lake in Nageshwar village. Unfortunately, the Harappan mound measuring 120 x 100 m was destroyed in 1976 by local earthwork contractors. The Maharaja Sayajirao University of Baroda conducted excavation at the site in 1983-84. Excavation revealed evidence of a 2m to 2.60m thick Harappan deposit divisible into two phases, Period IA and IB. The site badly destroyed by contractors who have removed almost whole mound for the earth filling. However, few

Harappan structures made of stone slab and rubble fire altar (?) or pottery kiln and other artefacts such as Classical Harappan ceramics and one stud handled bowl; stone weight, beads, blades and polishers; folded copper sheet and terracotta triangular cakes, bangles and toy cart frames were recorded from the site. The site has been identified as a shell object manufacturing settlement as large quantities of shell bangles, pendants, broken ladles, inlays, beads and debitage have been recovered. The site also yielded bone remains of cow, goat, sheep, buffalo, blue bull, antelope, spotted deer, sambar and marine fish. (Bhan et al. 1984; Hegde et al. 1990).

In the opinion of excavator 'the land all around the lake where the soil mantle above the local limestone bedrock is sufficiently thick and fertile for agricultural operation and the thick growth of tall, tubular, aquatic plants, locally known as Baru, *S. orghum* *Balepensis* believed to be suitable for building small sea-going vessels, appear to have attracted an early Harappan community to Nageshwar' (IAR 1983-84).

Lakhabaval

(22° 24' N; 70° 00' E) and Amara (22° 16' N; 69° 56' E)

Lakhabaval and Amara are located close to the southern shore of the Gulf of Kachchh about 9 to 12 miles north-west of Jamnagar. These sites have yielded Harappan pottery and other materials, similar to the pottery reported from Period IIA and IIB of Rangpur. Lakhabaval and Amara both on the estuary of Gulf of Kachchh, according to Rao (1963, 1991) were engaged in shell fishing and manufacturing of shell objects for export purposes.

Prabhas Patan/Somnath

(20° 53' 00" N, 70° 24' 00" E)

First phase of excavation at Nagra mound in Prabhas Patan conducted by the Department of Archaeology, Saurashtra and The Maharaja Sayajirao University of Baroda in 1955-56 and 1956-57 revealed a six fold cultural sequence starting from Late Harappan and ending with medieval period. However, in order to understand the cultural aspects of the site precisely, the site was subjected to further excavations in 1971-72, 1975-76 and 1976-77 by the Gujarat State Archaeology Department and Deccan College Post Graduate and

Research Institute, Pune. This phase of excavation revealed a sequence of five cultural periods datable from 3000 BC to 600 AD. The excavation brought to light existence of an important regional Chalcolithic tradition in the Saurashtra coast. The chalcolithic period has been divided into two sub-periods namely Pre-Prabhas (3000-2500 BC) and Prabhas (2300-1750 BC) (IAR 1955-56, 1956-57, Nanavati et al. 1971; Dhavalikar and Posschl 1992).

Bhagatray (21° 29' 00" N, 72° 42' 00" E)

Bhagatray located in Bharuch district was excavated by S.R. Rao of Archaeological Survey of India in 1957-58. The site is situated at the mouth of the Kim River, half a mile south of village Jetpur in Hansot Taluka of Bharuch District. Excavations revealed a 2.25 m deposit of two cultural periods, Period I and II, assignable respectively to the Harappan and medieval times. Period I was further divided into two sub-periods, IA and IB representing respectively the Urban Harappan and Post Urban Harappan phases of the Harappan culture (IAR 1957-58). Period IA yielded ceramic types similar to those from Lothal and Rangpur IIA while IB revealed Post Urban Harappan pottery forms like dish with a short projected rim and small jar with slightly elongated neck. According to excavator, Bhagatray seems to have been a port having contacts with Harappan sites in Saurashtra.

Mehgam (21° 42' 00" N, 72° 45' 00" E)

Mehgam, near Bharuch on the Narmada estuary, was excavated by S.R. Rao of Archaeological Survey of India in 1957-58. This Chalcolithic site yielded the dish-on-stand, jar with short neck, dish with slightly carinated shoulder of Urban (Sorath) and Post Urban Harappan (Late Sorath) assemblage. A bi-conical bead of agate and a few copper fragments were found but no structures noticed (IAR 1957-58).

Telod (21° 42' 00" N, 72° 46' 00" E)

Telod in Bharuch district on Narmada estuary was excavated in 1957-58 by the Archaeological Survey of India. The low lying mound yielded of ceramics of late phase of Rangpur IIB type (IAR 1957-58).

Discussion:

Lothal excavation in the sixties brought to light a unique and huge basin-like brick structure which was identified

as a 'dockyard'. This structure has created lot of curiosity both among scholars as well as common visitor to the site. After Lothal, Kuntasi on the southern shore of the Gulf of Kachchh was another site which yielded some remains which have been identified that of a jetty. Saran near Dholavira is another site on the shore of the Great Rann which provides minimum parameters required for a normal jetty. It is an estuarine port located at a safe landing space between two hillocks. So far other coastal sites are concerned, it is the geographical and environmental setting which is suggestive of their being a port site; no evidence of any jetty or platform is available in any of these sites. However, these sites are very close to the shore and most of them are linked with the sea or Gulf by a river or an estuary. Further it seems that functional requirement too was a factor for selection of the location (Chitalwala 1977). According to him 'most of the Harappan settlements in Kutch and Saurashtra were part of an extensive trading network and the communication was one three lines viz. over land communication between one and another settlement with in Kutch and Saurashtra, inter regional communication between Sind and Kutch/ and Saurashtra and international communication and overseas trade between Harappan sites in Kutch and Saurashtra and the Persian gulf' (Chitalwala 1982). Therefore, there is sound reason to believe that at least most of the fortified settlements along the shore of the Gulf of Kachchh were linked with each other through waterways and may have been transporting cargo to the nearest site across the Gulf. Most of these settlements appear to be involved in procurement of local resources and craft production for local consumption and supply to major regional centres. Interestingly, at most of the fortified settlements initially the Urban Harappan elements are more prominent but in the subsequent phases the Sorath material, especially the ceramics, appears increasing. This may have been due to increasing active participation of local folk in the growing economy.

According to Bowen (1951) "the Gulf sailing route was kept to the coast, when sailors had no aids other than the position of the sun and stars. Such a route must have been more easy to navigate and more convenient for repairs and maintenance works which all ships constantly need". However, Shereen Ratnagar (1981:) feels "believing too literally in a coastal route will be an injustice with early sailors as the Minoans of Crete of

the second millennium were about to sail across the high seas to Egypt, a distance of more than 700km". According to her 'many of the sites of Harappan or latter periods on Gujarat coast were some kind of "refuelling stations or anchorages if not actual ports'. This may be true for the fortified settlements situated on the shore line but the small rural settlements seem to have been occupied by the people subsisting on fishing and other such activities.

Nageshwer, Amara, Kuntasi and Bagasra on the Saurashtra coast and Navinal, Sevakiya, Shikarpur, Kanmer, Surkotada, Pabumath, Nerand JuniKuran all on the Kachchh/Rann coast seem to be functioning as small local ports involved in short distance trade through both overland and sea routes. However, Lothal and Dholavira seem to have been controlling the overall maritime trade supported by their sophisticated harbouring facilities. On the other hand Padri, Hanuman-no-Timbo, Kanjetar, Prabhas, Bokhira, Kinder Kheda, Kalyanpur, Lakhabawal, Amara located on the Saurashtra coast along with MithiRohar, Varnu. Lakhpatri, Luna, Todio etc. on Kachchh coast may have been small rural settlements subsisting on agriculture,

fishing activities and salt manufacturing. These sites do not seem to have been involved in maritime trade during Urban Harappan time but some of them could have served as refuelling stations during Late Urban and Post Urban Harappan time as suggested by Ratnagar. These sites could, have contributed to Harappan resource management mechanism through supplying agricultural yields, natural and sea resources to other hinterland sites or bigger centres of trade. Whereas, sites like Kuntasi, Bagasra on the southern shore of the Gulf of Kachchh, Sevakiya, Shikarpur on the northern shore of the same Gulf, Kanmer, Surkotada and Nagwada on the coast of the Little Rann and Dholavira, Pabumath, Ner and JuniKuran along the shore on the Great Rann of Kachchh and Lothal on the Gulf of Khambhat seem to have been associated with a greater chain of trade network or resource management mechanism in Gujarat. All these sites bear some similarity in their town planning, environmental setting and subsistence system. All of them were fortified and connected to the Gulf/Sea through small rivulets. Antiquarian remains recovered from some of these sites suggest that they were involved in the production of different varieties of craft-objects.



Fig. 21 Coastal sites and possible sea routes during Harappan time

The overall picture emerges is that of most of the sites of the Gujarat region, and those of south of the Great Rann of Kachchh, worked as partners in an economy that was based on exploitation of natural resources which were available in plenty in the Arabian sea and in the forested regions of the north and the central Gujarat and Saurashtra. Dholavira on the shoreline of Rann in the extreme north and Lothal on the Arabian Sea in the south were two major centres of this economy. Therefore, these two settlements could have been regulating international trade activity on behalf of the majority of these sites. This inference is also supported by the availability of items of foreign origin at both these sites.

Geological investigations in the Rann of Kachchh have revealed that the Little Rann had 4m deep water up to

2000 yrs. B.P. (Gupta 1977). Our excavation at Kanmer supported with GIS survey and simulation of the Sea level in Gujarat region suggests that a 1.0m increase in the present Sea level makes the whole Gulf of Kachchh and the Rann navigable. At this MSL Kachchh could have been an island which was connected with Saurashtra on the south across the Gulf of Kachchh and Indus region on the north across the Great Rann only through the waterways. Location of many Harappan sites on opposite shores of Gulf is a strong indication for this presumption. Therefore, at the local level, small settlements may have been communicating and interacting with each other, exchanging their products to meet their requirements. But at the macro-level, large settlements were playing a bigger role to import or and export regional products to other countries of the Old World civilizations.

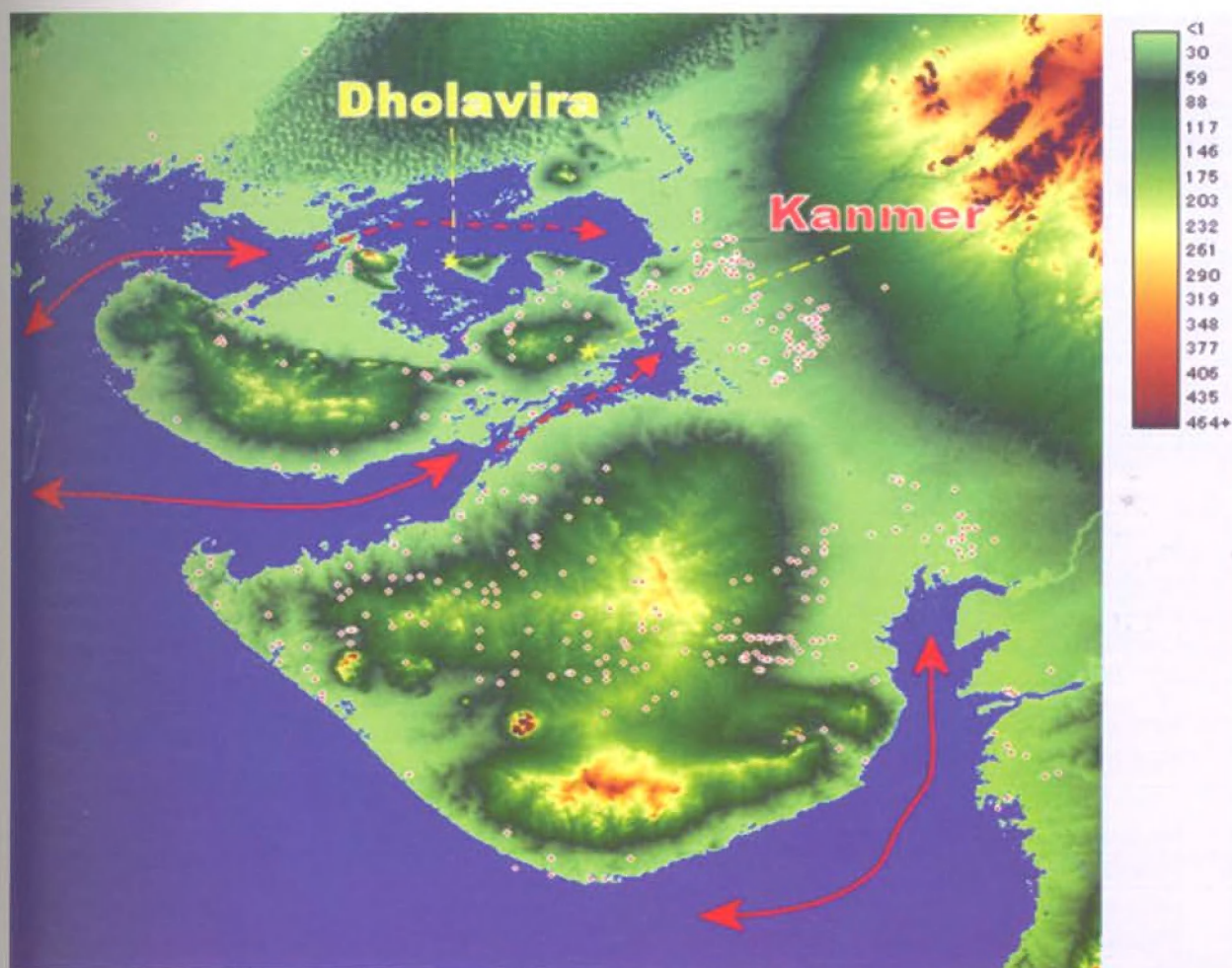


Fig. 22 Sea level simulation: +1m ASL (After Indus Project, Research Institute for Humanity and Nature)

List of Harappan sites located on Gujarat coast:

Sl.No	Name of site	Geo-coordinate	Location	Period
1	Kanmer, Rapar	23° 23'N; 70° 40'E	Little Rann of Kachchh	Mature Harappan
2	Khandariya (Varnu), Rapar	23° 28'N; 70° 03'E	Little Rann of Kachchh	Late Harappan
3	Surkotada, Rapar	23° 37'N; 70° 50'E	Little Rann of Kachchh	Mature Harappan
4	Nagwada 1 & 2, Dasada	23° 17'N; 71° 52'E	Little Rann of Kachchh	Mature Harappan
5	Dholavira-Saran, Bhachau	23° 53'N; 70° 13'E	Great Rann of Kachchh	Mature Harappan
6	Pabumath, Rapar	23° 37'N; 70° 31'E	Great Rann of Kachchh	Mature Harappan
7	Ner, Bhachau	23° 25'N; 70° 18'30"E	Great Rann Kachchh	Mature Harappan
8	JuniKuran, Bhuj	23° 57'76"N; 69° 45'91"E	Great Rann Kachchh	Mature Harappan
9	Katesar, Lakhpat	3° 34'N; 69° 29'E	Great Rann of Kachchh	Mature Harappan
10	Todio (Bhedi no Timbo), Abdasa	23° 05'N; 68° 55'E	South-west Kachchh coast	Mature Harappan
11	Navinal, Mundra	22° 50'N; 69° 35'E	South Kachchh coast	Mature Harappan
12	MithiRohar, Anjar	23° 06'N; 70° 11'E	South-east Kachchh coast	Late Harappan
13	Shikarpur, Bhachau	23° 14'N; 70° 40'E	Gulf of Kachchh	Mature Harappan
14	Sevakiya, Bhachau	23° 16'N; 70° 19'E	Gulf of Kachchh	Mature Harappan
15	Amara, Jamnagar	22° 16'N; 69° 56'E	Gulf of Kachchh	Mature Harappan
16	Lakhabaval, Jamnagar	22° 24'N; 70° 00'E	Gulf of Kachchh	Mature/Late Harappan
17	Vasai, Jamnagar	22° 24'N; 70° 00'E	Gulf of Kachchh	Late Harappan
18	Kuntasi, Morbi	22° 53'N; 70° 37'E	Gulf of Kachchh	Mature Harappan
19	Bagasra, Maliya	23° 03'; 70° 37'E	Gulf of Kachchh	Mature Harappan
20	ageshwer, Okha	22° 24'N; 69° 05'E	West Saurashtra coast	Mature Harappan
21	Bet Dwarka, Okha	2° 28'N; 69° 06'E	West Saurashtra coast	Late Harappan
22	Kalianpur, Jamnagar	21° 50'N; 69° 25'E	South-west Saurashtra coast	Mature Harappan
23	Kindarkheda, Porbandar	22° 48'N; 69° 33'E	South-west Saurashtra coast	Late Harappan
24	Bokhira, Porbandar	22° 39'N; 69° 36'E	South-west Saurashtra coast	Late Harappan
25	Prabhas, Junagadh	20° 53'00"N; 70° 24'00" E	South Saurashtra coast	Chalcolithic
26	Kanjetar/Kaj, Kodinar	20° 44'N; 70° 40'E	South Saurashtra coast	Late Harappan
27	Padri, Talaja	22° 22'N; 72° 95'E	South-east Saurashtra coast	Chalcolithic/Harappan
28	Hanumanno/Timbo, Sartanpur near Talaja	21° 18'53"N; 72° 05'21"E	East Saurashtra coast	Harappan
29	Valabhi	22° 41'N; 71° 38'E	Gulf of Khambhat	Harappan
30	Lothal, Dholka	22° 31'N; 72° 15'E	Gulf of Khambhat	Mature/Late Harappan
31	Telod, Bharuch	21° 42'00"N; 72° 46'00"E	South Gujarat coast	Late Harappan
32	Mehgam, Bharuch	21° 42'00"N; 72° 45'00" E	South Gujarat coast	Late Harappan
33	Malwan, Surat	21° 71'N; 72° 42'E	South Gujarat coast	Late Harappan
34	Bhagatrav, Bharuch	21° 29' 00"N; 72° 42'00" E	South Gujarat coast	Late Harappan
35	Hasanpur, Bharuch	21° 15'N; 72° 45'E	South Gujarat coast	Late Harappan
36	Budhel, Bhavnagar	21° 45'N; 72° 09'E	East Saurashtra coast	Late Harappan
37	Nava Ratanpur, Bhavnagar	21° 39'12"N; 72° 16'43"E	East Saurashtra coast	Harappan
38	Koliyak, Bhavnagar	21° 36'01"N; 72° 16'46"E	East Saurashtra coast	Harappan
39	Lonsapur, Bhavnagar	20° 57'39"N; 71° 24'82"E	East Saurashtra coast	Harappan
40	Kalsar, Bhavnagar	21° 07'03"N; 71° 53'66"E	East Saurashtra coast	Harappan
41	Satra, Bhavnagar	21° 06'62"N; 71° 50'24"E	East Saurashtra coast	Harappan
42	Dhakana, Bhavnagar	21° 18'95"N; 72° 04'33"E	East Saurashtra coast	Harappan
43	Lilivav, Bhavnagar	21° 20'52"N; 72° 03'22"E	East Saurashtra coast	Harappan
44	Shahavadar, Bhavnagar	21° 17'27"N; 72° 03'83"E	East Saurashtra coast	Harappan

References

Ajithprasad, P., 2006, paper presented in the Magan and Indus Civilization conference in Baroda.

Chalcolithic Cultural Patterns and the Early Harappan Interaction in Gujarat, Cultural Relations between the Indus and the Iranian Plateau during the Third Millennium BCE, Tosiki Osada and Michael Witzel(eds.), Harvard Oriental Series, Opera Minora Vol.7. Cambridge, pp. 11-40.

Annual Report Department of Archaeology, Government of Gujarat, 1980-81:4-5

Bhan, K.K and J.M. Kenoyer, 1984, 'Nageshwer: A Mature Harappan Shell Working Site on the Gulf of Kachchh', *Journal of the Oriental Institute* 34 (1-2):115-120.

Bhan, K.K and Dakshayani Gowda, 2003, 'Shell working at Nagwada (North Gujarat) with special Reference to Shell Industries of the Harappan Tradition in Gujarat, Man and Environment, Vol. XXVIII No. 2:51-80.

Bhan, K.K. and P. Ajithprasad, 2008, 'Excavation at Shikarpur 2007-2008: A Coastal Port and Craft production Centre of the Indus Civilization in Kutch, India'. www.harappa.com

Bhan, K.K., et al., 2005, 'A Harappan trading and craft production centre at Gola dharo (Bagasara)', *Antiquity* 79(304):1-7.

Bisht, R.S., 1991, 'Dholavira: A New Horizon of the Indus Civilization', *Puratattva* 20:71-82.

1997, 'Dholavira Excavations: 1990-94', *Facets of Indian Civilization: Recent Perspectives*, Joshi, J.P. (ed.), Aryan Books International, New Delhi, pp107-120.

Bowen, 1951, 'The Dhow Sailor', Reprint from *American Neptune* XI. 3:1522-37.

Carla Lancelotti and Marco Madella, 2011, Preliminary anthracological analysis from Harappan Kanmer: Human-environment interactions as seen through fuel resources exploitation and use, *Linguistics, Archaeology and the Human Past*, Occasional Paper 10, Toshiki Osada and Akinori Uesugi (eds.), Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan, pp129-142.

Chakrabarti, Dilip K., 1990, 'The external trade of the Indus Civilization', Munsiram Manoharlal Publishers Pvt Ltd, New Delhi.

Chitalwala, Y.M., 1977, Harappan and Post-Harappan Settlement in Saurashtra, *Ecology and Archaeology of Western India*, D. P. Agrawal and B.M.Pande (eds.), pp 93-98.

1982, Harappan Settlements in Kutch-Saurashtra Region: patterns of distribution and Routes of Communication, *Harappa Civilization- A contemporary Perspective*, G.L.

Posschel (ed.), Oxford IBH Publishing Co. New Delhi, pp197-202.

Cleuziou, S., 1992, The Oman Peninsula and the Indus Civilization: A Reassessment, *Man and Environment* Vol. XVII No. 2: 93-104.

Deo, S., S. Ghate and S.N. Rajaguru, 2010, Holocene environmental changes and cultural patterns in coastal western India, *Quaternary International* 229(2011):132-139.

Dhavalikar, M.K., et al., 1996, 'Kuntasi – A Harappan Emporium on West Coast, Deccan College Research Institute, Pune.

Gaur A.S. and Sundresh, 2003, 'Onshore excavation at Bet Dwarka Island, in the Gulf of Kachchh, Gujarat', *Man and Environment* XXVIII (1): 57-66.

2005, A Late Harappan Port at Kinderkheda on Saurashtra Coast, *Man and Environment* XXX (2): 44-48.

Gaur, A.S., Sundresh and P.P. Joglekar., 2006, 'Excavation at Bokhira (Porbandar) on Saurashtra Coast', *Man and Environment* XXXI (1):33-39.

Gaur A.S., et al, 2011, Excavation at Kanjetar and Kaj on the Saurashtra Coast, Gujarat, *Man and Environment* XXXVI (2), pp 51-57, Indian Society for Prehistoric and Quaternary Studies.

Gaur, A.S. Sundresh and Silo Tripathi., 2011, 'Ancient Anchorage System in India with Reference to the Gujarat Coast', Gujarat and the Sea, Lotika Varadarajan (ed.), Darshak Itihas Nidhi, Vadodara, pp 89-106.

Gupta, S.K. 1977, Holocene Silting in the Little Rann of Kutch, *Ecology and Archaeology of Western India*, D.P. Agrawal and B.M. Pande (eds.), Concept Publishers, Delhi, pp 200-205.

Indian Archaeology – A Review (IAR) 1955-56:7; 1957-58:15; 1977-78:21; 1978-79:67-68; 1980-81:14 ;1983-84:18-19; 1986-87:29; 1987-88:14-15; 1988-89:10; 1989-90:15-21; 1990-91:10-12; 1991-92:26-35; 1992-93:27-31;1995-96:16-22; 1996-97:11-19; 1997-98: 19-22; 1998-99:6-7;1999-2000:22-30.

Hegde, K.T.M., et al., 1988, 'Excavation at Nagwada 1986-1987: A Preliminary Report', *Man and Environment* XII: 55-65.

et al., 1990, 'Excavation at Nageshwer, Gujarat: A Harappan Shell Working Site on the Gulf of Kutch, Maharaja Sayajirao University Archaeology Series (18),Vadodara.

Joshi, Jagatpati, 1972. Exploration in Kachchh and Excavation at Surkotada and New Light on Harappan Migration, *Journal of the Oriental Institute, MSU Baroda* 22:98-144

1990. Excavation at Surkotada and Exploration in Kutch, Memoirs of the Archaeological Survey of India No.87.

Kazuya Maekawa and Wakaha Mori, 2011, 'Dilmun, Magan, and Meluhha in Early Mesopotamian History: 2500-1600BC, Cultural Relations between the Indus and the Iranian Plateau during the Third Millennium BCE, Tosiki Osada and Michael Witzel (eds.), Harvard Oriental Series, Opera Minora Vol.7. Cambridge, pp. 245-269.

Kenoyer, J.M., 1998, 'Ancient cities of The Indus Valley Civilization', American Institute of Pakistan Studies. Oxford University Press, Karachi.

Khadkikar, A.S., N. Basavaiah, T.K. Gundurao and C. Rajshekhar, 2004, 'Palaeoenvironment around the Harappan Port of Lothal, Gujarat, Western India', Journal of Indian Geophysicist Union, Vol.8, No.1: 49-53.

Kharakwal, J.S., Y.S. Rawat and T. Osada, 2011, Annual report of the excavation at Kanmer 2007 and 2008-09, Preliminary, Linguistics, Archaeology and the Human Past, Occasional Paper 10, Toshiki Osada and Akinori Uesugi (eds.), Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan, pp 71-104.

'Excavation at Kanmer 205-06-2008-09', Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan.

Kumaran, R.N., 2009, 'Ports and Pots in Gujarat', Tanjavur.

Lal, B. B., 1994, 'The chronological Horizon of the Mature Indus Civilization', From Sumer to Meluhha: Contribution to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., Jonathan Mark Kenoyer., (ed.), Wiscosin Archaeological Reports, Vol. 3:15-25.

1997, The Earliest civilization of South Asia. Aryan Books International, New Delhi, p 181-182.

Leshnik, Lawrence S., 1968, 'The Harappan "Port" at Lothal: Another View', American Anthropologist 70: 911-922

Mackay, E.J.H., 1938, 'Further Excavations at Mohenjodaro', Government of India Press, New Delhi. p 5&647

Meadow, R. H., 1994, 'From Sumer to Meluhha: Contribution to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., Jonathan Mark Kenoyer., (ed.), Wiscosin Archaeological Reports, Vol. 3: xx.

Mughal, M. Rafique, 1992, The Geographical Extent of the Indus Civilization during the Early, Mature and Late Harappan Times, in South Asian Archaeology Studies, Possehl, G. (ed.), New Delhi, Oxford & IBH Publishing Co.:123-143.

Pandya, Suman, 1977, 'Lothal Dock-Yard hypothesis and Sea Level changes', Ecology and Archaeology of Western India, Agrawal, D.P. and B.M. Pande (eds.), Delhi, pp. 99-103.

Possehl, G.L. and K.A.R. Kennedy, 1979, Hunter-gatherer/agriculturalist exchange in prehistory: an Indian example, Current Anthropology, 20(3): 592-93.

Pramanik, S., 2004, 'Excavation at Juni Kuran 2003-04 : A Preliminary Report', Puratattva (34): 45-67.

Rajesh, S.V., 2011, 'A Comprehensive Study of the Regional Chalcolithic Cultures of Gujarat', unpublished Ph.D. thesis, Department of Archaeology & Ancient History, the Maharaja Sayajirao Gaikwad University of Baroda, p. 159.

Ratnakar, Shereen, 1981, 'Encounters - The Westerly Trade of the Harappan Civilization', New Delhi, Oxford Univ. Press.

Rao, S.R., 1963, 'Excavation at Rangpur and other Explorations in Gujarat', Ancient India 18 & 19:183-4 & 207.

1965, 'Shipping and Maritime Trade of the Indus People', Expedition 7 (3):30-37.

1979, 'Lothal: A Harappan Port Town, 1955-62', Memoirs of the Archaeological Survey of India. No.78, Vol. I

1985, 'Lothal: A Harappan Port Town, (1955-62)', Memoirs of the Archaeological Survey of India. No.78, Vol. II.

1991, Down and Devolution of Indus Civilization, Aditya Prakashan New Delhi, p.153.

Rao, L.S., 1992, 'Harappan Ports in India', New Trends in Indian Art and Archaeology, Nayak, B.U. and Joshi, N.C. (ed.), Delhi, pp. 89-100.

Shah, U.P., 1960, 'Lothal - a Port', Journal of Oriental Institute V: 9.

Shinde, V., 1992, 'Excavations at Padri - 1990-91: A Preliminary Report', Man and Environment Vol. XVII (1): 79-86.

Sonwane, V.H., et Al., 2003, 'Excavation at Bagasara-1996-2003: A Preliminary Report. Man and Environment Vol. XXVIII (2): 21-50.

Srivastava, K.M., 1991, 'Madinat Hamad Burial Mounds-1984-85', Bahrain National Museum.

Tripathi, Alok, 2011, Harappan Ships and Maritime Spheres, Gujarat and the Sea, Lotika Varadarajan (ed.), Darshak Itihas Nidhi, pp 265-280.



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